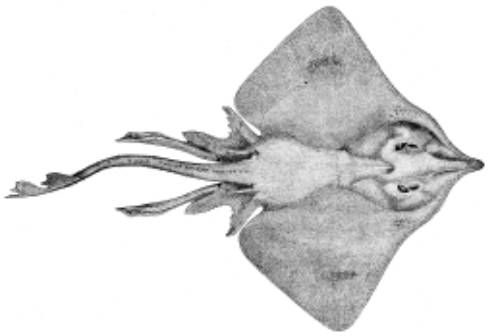

Last Revised: January 2000

Summary Status

Landings and Abundance Trends

Landings Data

Skates

by
Katherine A. Sosebee

Skates, Family Rajidae, are distributed throughout the Northwest Atlantic from near the tide line to depths exceeding 700 m (383 fathoms). Members of this family lay eggs that are enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 to 12 months, with the young having the adult form at the time of hatching. There are seven species of skates occurring along the North Atlantic coast of the United States: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis*), thorny skate (*Amblyraja radiata*), clearnose skate (*Raja eglanteria*), rosette skate (*L. garmani*) and smooth skate (*Malacoraja senta*).

The center of distribution for little, winter and barndoor skates is Georges Bank and Southern New England. The thorny and smooth skates are commonly found in the Gulf of Maine. The clearnose and rosette skates are southern species, occurring primarily in the Middle Atlantic and off Southern New England. Skates are not known to undertake large-scale migrations, but they do move seasonally in response to changes in water temperature, generally offshore in summer and early autumn and *vice-versa* during winter and spring.

The principal commercial fishing method used to catch skates is otter trawling. Skates are frequently taken as bycatch during groundfishing operations and discarded. Recreational and foreign landings are insignificant. There are currently no regulations directly governing the harvesting of skates in U.S. waters; however, a plan will be developed in the near future.

Skates have been reported in New England fishery landings since the late 1800s. However, landings (primarily from off Rhode Island) never exceeded more than a few hundred metric tons until the advent of distant-water fleets during the 1960s. Skate landings peaked in 1969 at 9,500 mt and again in 1972 at 8,800 mt, but declined quickly during the 1970s, and bottomed out at 500 mt in 1981. Reported landings have since increased substantially, partially in response to increased demand for lobster bait and to the increased export market for skate wings, and also due to improved statistical data collection. Wings are taken from winter and thorny skates, the two species currently known to be used for human consumption. Bait landings appear to be primarily from little skate, based on areas fished and known species distribution patterns.

Landings increased to 12,900 mt in 1993, declined somewhat to 7,200 mt in 1995, and subsequently rose sharply to an average of 13,000 mt from 1996-1998.

Conclusions about the status of the seven species in the northeast U.S. skate complex are based mainly on standardized research trawl survey data collected by the US and Canada during 1963-1999. Taken as a group, biomass for these seven species is now at a medium level. The NEFSC spring survey biomass index was relatively constant from 1968 to 1980, then increased significantly to peak levels in the 1980s. The index then declined steadily until 1994, but has recently begun to increase again. The large increase in skate biomass in the early to mid-1980s was dominated by winter and little skate. The biomass of large sized skates (>100 cm maximum length; barndoor, winter, and thorny) has steadily declined since the mid-1980s. Recently there has been an increase in the biomass of small skates of <100 cm maximum length (little, clearnose, rosette, and smooth, mainly little skate). The above large-bodied skates and all primary skate species in the Gulf of Maine (thorny and smooth) are currently overfished, and overfishing is occurring on winter skate. Reductions in fishing mortality are required to eliminate overfishing of winter skate and to promote rebuilding of other overfished skate species.

Winter skate abundance is currently about the same as in the early 1970s, at about 25% of the peak observed during the mid 1980s. Comparison of the current fishing mortality rate (NEFSC spring survey; F = 0.39) to the proposed SFA threshold fishing mortality reference point (F = M = 0.1) indicates that overfishing for winter skate is occurring. The 1996-1998 NEFSC autumn survey biomass index average of 2.83 kg/tow is below the proposed SFA biomass threshold reference point of 3.23 kg/tow, indicating an overfished condition.

Little skate abundance began to increase in the early 1980s, and has increased to the highest abundance since 1975. Comparison of the current fishing mortality rate (NEFSC spring survey; F = 0.34) to the proposed SFA threshold fishing mortality threshold reference point (F = M = 0.4) indicates that overfishing for little skate is not occurring. The 1997-1999 NEFSC spring survey biomass index average of 6.72 kg/tow is above the proposed SFA biomass threshold reference point of 3.27 kg/tow. Little skate is not overfished.

The abundance of barndoor skate declined continuously through the 1960s to historic lows during the early 1980s. Since 1990, abundance has increased slightly on Georges Bank, the western Scotian Shelf, and off Southern New England, although the current NEFSC autumn survey biomass index is still less than 5% of the peak observed in 1963. The current fishing mortality rate is unknown, and a fishing mortality reference point has not yet been determined. The 1996-1998 NEFSC autumn survey biomass index of 0.08 kg/tow is below the proposed SFA biomass threshold reference point of 0.81 kg/tow, indicating an overfished condition.

The abundance of thorny skate has declined to historic lows. Current abundance is about 10%-15 % of the peak observed in the late 1960s to early 1970s. The current fishing mortality rate is unknown, and a fishing mortality reference point has not yet been determined. The 1996-1998 NEFSC autumn survey biomass index of 0.77 kg/tow is below the proposed SFA biomass threshold reference point of 2.20 kg/tow, indicating an overfished condition.

The abundance of smooth skate was highest during the early 1960s and late 1970s. The current fishing mortality rate is unknown, and a fishing mortality reference point has not yet been determined. The 1996-1998 NEFSC autumn survey biomass index of 0.15 kg/tow is below the proposed SFA biomass threshold reference point of 0.16 kg/tow, indicating an overfished condition.

The abundance of clearnose skate has been increasing since the mid 1980s. The current fishing mortality rate is unknown, and a fishing mortality reference point has not yet been determined. The 1996-1998 NEFSC autumn survey biomass index of 0.72 kg/tow is above the proposed SFA biomass threshold reference point of 0.28 kg/tow. Clearnose skate is not overfished.

The abundance of rosette skate has been increasing since 1986. The current fishing mortality rate is unknown, and a fishing mortality reference point has not yet been determined. The 1996-1998 NEFSC autumn survey biomass index of 0.040 kg/tow is above the proposed SFA biomass threshold reference point of 0.015 kg/tow. Rosette skate is not overfished.

For further information

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Summary Status

Species		Winter	Little	Barndoor	Thorny	Smooth	Clearnose	Rosette
Long-term potential catch (MSY)	=	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Target biomass reference point proxy[1]	=	6.46	6.54	1.62	4.41	0.31	0.56	0.029
Threshold biomass reference point proxy[1]	=	3.23	3.27	0.81	2.20	0.16	0.28	0.015
Stock biomass index[2]	=	2.83	6.72	0.08	0.77	0.15	0.72	0.040
F_{MSY} =F_{TARGET}=Overfishing definition[3] = M	=	0.10	0.40	Unknown	Unknown	Unknown	Unknown	Unknown
F_{1999}[4]	=	0.39	0.34	Unknown	Unknown	Unknown	Unknown	Unknown
Age at 50% maturity	=	6 years [5]	4 years[6]	8 years[7]	7 years[7]	5 years[7]	6.5 years[7]	4 years[7]
Size at 50% maturity, cm (in.)	=	75(29.5)[5]	40(15.8) [6]	102(40.2)[7]	84(33.1)[7]	56(22.0)[7]	61(24.0)[7]	46(18.1)[7]
Assessment level	=	Index	Index	Index	Index	Index	Index	Index
Management	=	None	None	None	None	None	None	None

[1] SARC-30 proposed proxies for SFA target biomass reference points based on NEFSC spring and autumn survey indices (kg/tow), e.g. for winter skate, the proxy is the 75th percentile of the NEFSC autumn biomass indices for the Gulf of Maine to the Mid-Atlantic during 1967-1998. In all cases SFA threshold biomass reference points are one-half the proxy target biomass reference point value.

[2] Most-recent 3-year NEFSC survey index average (kg/tow).

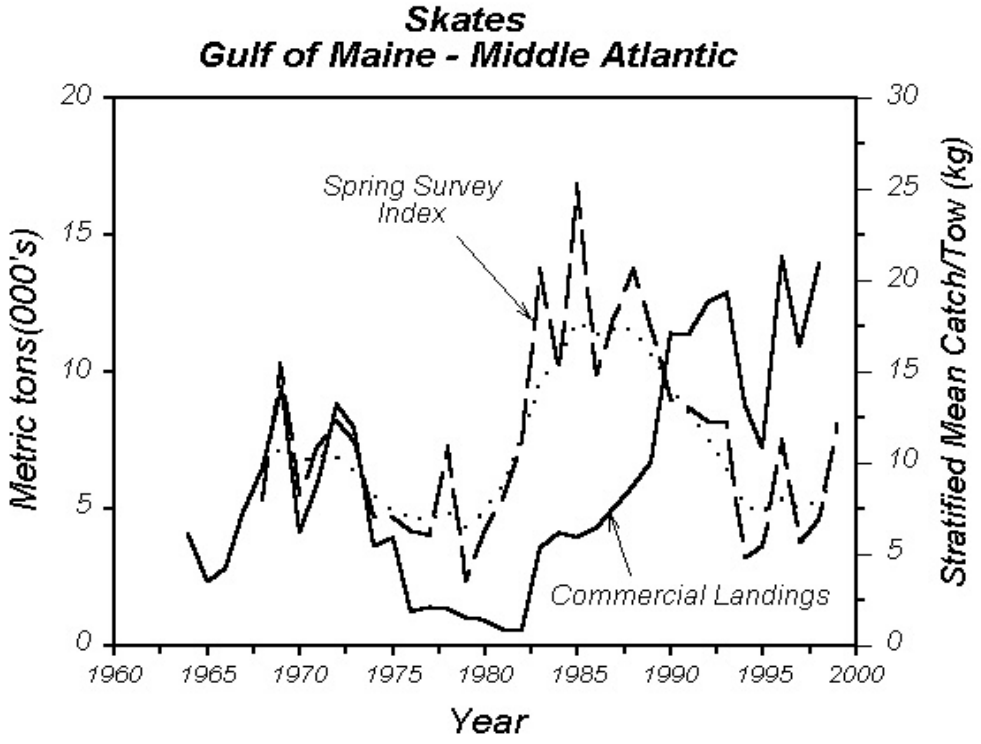
[3] SARC-30 recommended F=M as proxies for the SFA threshold fishing mortality reference point for winter and little skate.

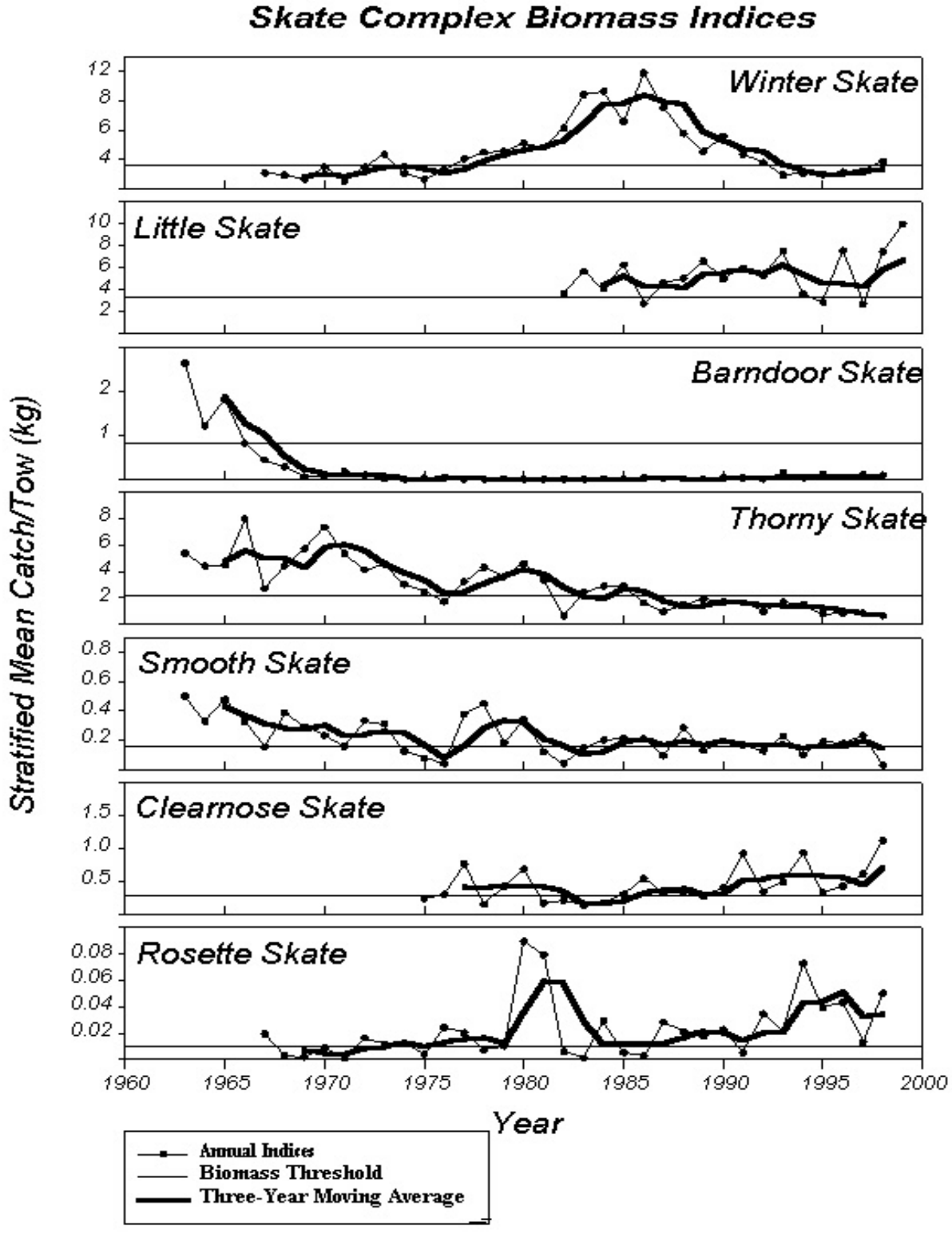
[4] Averaged over 1995-1999 for winter skate and over 1997-1999 for little skate.

[5] Simon and Frank (1996, 1998).

[6] Waring (1984).

[7] Predictive equation in Frisk (MS 1999).




Skate Complex Biomass Indices
Winter Skate
Little Skate
Barndoor Skate
Thorny Skate
Smooth Skate
Clearnose Skate
Rosette Skate
Stratified Mean Catch/Tow (kg)
Year
1960
1965
1970
1975
1980
1985
1990
1995
2000
Annual Indices
Biomass Threshold
Three-Year Moving Average

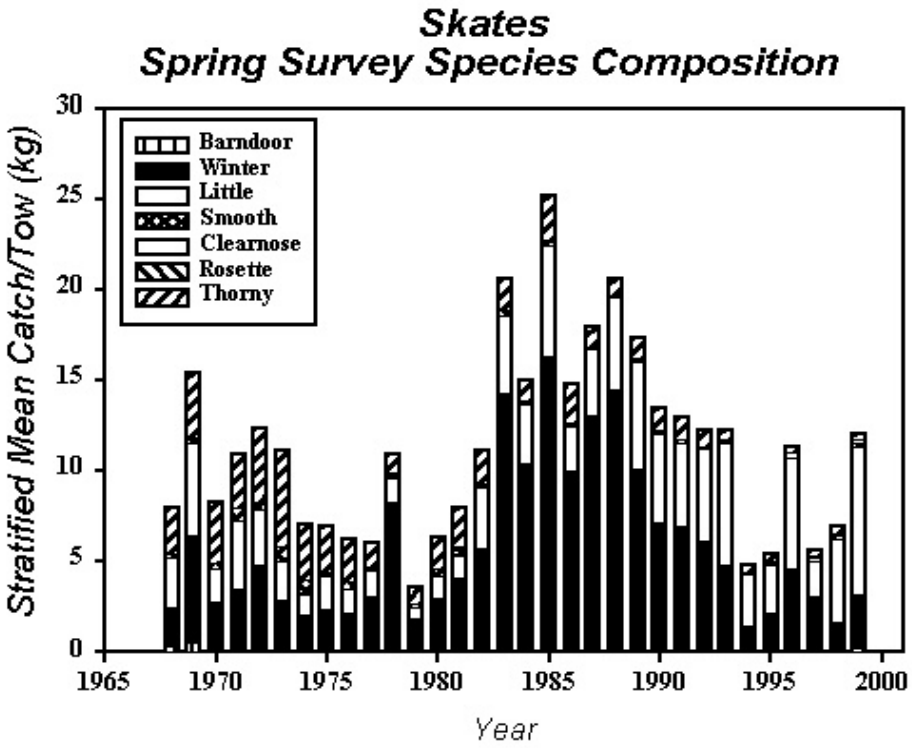


Table 26.1 Recreational catches and commercial landings (thousand metric tons)

		Year									
Category	**1979-88 average**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
U.S. recreational	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Commercial											
United States	3.3	6.7	11.4	11.3	12.5	12.9	8.8	7.2	14.2	11.0	13.9
Canada	<0.1	-	<0.1	<0.1	-	-	-	-	-	-	-
Other	<0.1	-	-	-	-	-	-	-	-	-	-
Total nominal catch	3.3	6.7	11.4	11.3	12.5	12.9	8.8	7.2	14.2	11.0	13.9